APPENDIX A

VERSION WITH MARKINGS TO SHOW CHANGES MADE

1. (Amended) A microfluidic device comprising a microchannel [(2, 4)], providing for liquid contact between an open microarea [(MA)] or chamber suitable for carrying a microvolume [(1)] of a solvent and a reservoir [(3, 8)] for the solvent, said reservoir [(3, 8)] and said microchannel [(2, 4)] being adapted so that solvent evaporated from said microarea [(MA)] is able to be continuously replaced by solvent from the reservoir [(3, 8)] through said microchannel[(2, 4)].

2. (Amended) The microfluidic device according to claim 1 wherein

a) said reservoirvessel [(3, 8)] is positioned so as to create an overpressure in the solvent which is in equilibrium with the interfacial pressure difference across the curved surface of the droplet, or

b) said reservoir [(3, 8)] is connected to pump means that either facilitate replacement of solvent by pumping solvent or pressurising the reservoir[(3, 8)].

3. (Amended) The microfluidic device according to [anyone of] claim[s] 1[-2] comprising a plurality of microchannels [(3, 8)] and open chambers forming an array in the circular or rectangular format.

4. (Amended) The microfluidic device according to [anyone of] claim[s] 1[-3], wherein the microvolume contains one or more reactants that are soluble in the solvent or bound to a solid support in contact with the microvolume.

5. (Amended) The microfluidic device according to claim 4 wherein at least one of said one or more reactants is an affinity reactant[, for instance] selected from the group consisting of nucleic acids, peptides, and proteins.

6. (Amended) A method for replacing solvents evaporating from a microvolume of solvent placed in an open microarea [(MA)] of a microfluidic device comprising the step of [characterised in that that replacement] replacing [is] solvent continuously

[taking place] via a microchannel [(2, 4)] that transports liquid to the microarea [(MA)] from a liquid reservoir [(vessel) (3, 8)].

7. (Amended) The method of claim 6, wherein the [characterised in that] the microarea [(MA)] , microchannel [(2, 4)] and reservoir are parts of a microfluidic device [defined in claims 1-5].

8. (Amended) A [M]method for replacing solvents for preventing samples from becoming desiccated [characterised in that it comprises] comprising the following steps:

providing a microarea (MA) for receiving a sample;

connecting the microarea [(MA)] to a reservoir [(3, 8)] of solvent by a microchannel [(2, 4)];

applying the sample to the microarea [(MA)];

allowing solvent to evaporate from said microarea [(MA)]; and

continuously replacing said evaporated solvent with solvent from said reservoir [(3, 8)].

9. (Amended) The [M]method [in accordance with] of claim 8 further comprising the step of [characterised in that it comprises the additional step of:] anchoring the sample to the microarea [(MA)].

10. (New) The method of claim 7, wherein the reservoir is positioned so as to create an overpressure in the solvent which is in equilibrium with the interfacial pressure difference across the curved surface of the droplet or said reservoir is connected to pump means that either facilitate replacement of solvent by pumping solvent or pressurising the reservoir.

11. (New) The method of claim 7, wherein the microfluidic device comprises a plurality of microchannels and open chambers forming an array in the circular or rectangular format.

12. (New) The method of claim 7, wherein the microarea carrys a microvolume containing one or more reactants that are soluble in the solvent or bound to a solid support in contact with the microvolume.

13. (New) The method of claim 12, wherein at least one of said one or more reactants is an affinity reactant selected from the group consisting of nucleic acids, peptides, and proteins.

APPENDIX B

CLEAN COPY OF PENDING CLAIMS AS OF PRELIMINARY AMENDMENT DATED APRIL 30, 2001

1. A microfluidic device comprising a microchannel, providing for liquid contact between an open microarea or chamber suitable for carrying a microvolume of a solvent and a reservoir for the solvent, said reservoir and said microchannel being adapted so that solvent evaporated from said microarea is able to be continuously replaced by solvent from the reservoir through said microchannel.

2. The microfluidic device according to claim 1 wherein

   a) said reservoir is positioned so as to create an overpressure in the solvent which is in equilibrium with the interfacial pressure difference across the curved surface of the droplet, or

   b) said reservoir is connected to pump means that either facilitate replacement of solvent by pumping solvent or pressurising the reservoir.

3. The microfluidic device according to claim 1 comprising a plurality of microchannels and open chambers forming an array in the circular or rectangular format.

4. The microfluidic device according to claim 1, wherein the microvolume contains one or more reactants that are soluble in the solvent or bound to a solid support in contact with the microvolume.

5. The microfluidic device according to claim 4 wherein at least one of said one or more reactants is an affinity reactant selected from the group consisting of nucleic acids, peptides, and proteins.

6. A method for replacing solvents evaporating from a microvolume of solvent placed in an open microarea of a microfluidic device comprising the step of replacing solvent continuously via a microchannel that transports liquid to the microarea from a liquid reservoir.

7. The method of claim 6, wherein the microarea, microchannel and reservoir are parts of a microfluidic device.

8. A method for replacing solvents for preventing samples from becoming desiccated comprising the following steps:

providing a microarea for receiving a sample;

connecting the microarea to a reservoir of solvent by a microchannel;

applying the sample to the microarea;

allowing solvent to evaporate from said microarea; and

continuously replacing said evaporated solvent with solvent from said reservoir.

9. The method of claim 8 further comprising the step of anchoring the sample to the microarea.

10. The method of claim 7, wherein the reservoir is positioned so as to create an overpressure in the solvent which is in equilibrium with the interfacial pressure difference across the curved surface of the droplet or said reservoir is connected to pump means that either facilitate replacement of solvent by pumping solvent or pressurising the reservoir.

11. The method of claim 7, wherein the microfluidic device comprises a plurality of microchannels and open chambers forming an array in the circular or rectangular format.

12. The method of claim 7, wherein the microarea carrys a microvolume containing one or more reactants that are soluble in the solvent or bound to a solid support in contact with the microvolume.

13. The method of claim 12, wherein at least one of said one or more reactants is an affinity reactant selected from the group consisting of nucleic acids, peptides, and proteins.